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Short Report

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What is the relationship between intervalvular fibrosa and previous chest radiation?

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Short report

Cancer is the second cause of death through the world [1]. Advance and curable cancer treatment are developing during recent years so number of cancer survivors are grown and risk of cardiovascular complications and death increase too [2].

Radiation therapy is one of the most important curative treatment in more than fifty percent of cancer patients which is used in thoracic malignancy such breast, lung, esophagus, gastric and lymphoma and also in childhood cancers [3]. Risk factors for developing cardiovascular injury related radiation consist dose radiation, volume heart radiated, concomitant chemotherapy agents, younger patients, history of cardiac disease and traditional cardiovascular risk factors [4]. Cardiac toxicity risk increases with dose more than 15 GY, whether the highest risk is seen with at least 35 GY [5] and risk increase 1.5-7% in per 1 GY mean heart dose also [3]. The first step in radiation associated cardiac disease arises from endothelial cell senescence due to radiation then proinflammatory cytokines and proteins are released and cause fibrin deposition in cardiac tissues and damage cardiac structures and reduce functions [6]. Although post radiation cardiac damage can occur 1 day after completing radiation consist increased echodensity in right ventricle wall and septum along with reduced right ventricle systolic function which do not have association to future cardiovascular event , the most important cardiac events occur during first two years after thoracic radiation [3] and affect morbidity and mortality in cancer patients [7].

Routinely, in all cancer patients candidate for chest radiation, base line screen for assessment of cardiovascular risk factors is recommended and in following, all cancer survivors must screen for cardiac complications of chest radiation within five to ten years after treatment. Echocardiography is used as a first line, simple and low cost method to screen radiation induced cardiac disease such systolic and diastolic ventricles function, pericardial and valvular involvement [5,7]. Valvular disease is seen about 26% at ten years and 60% at twenty years after chest radiation due to valve and peri valve region fibrosis and calcification, especially in left side valves structures because they are closer to chest wall and radiation source [4,5]. Typically, aortomitral curtain calcification and thickening is seen on echocardiography

which is done in cancer survivors with history of radiation associated cardiac disease and against rheumatic heart disease, there was not seen commissural fusion in accompanied valvopathy [4], it is easy method to measure total burden of cardiac calcification and is also quantitative measurement of cardiac or valvular calcification [8]. Aortomitral curtain thickening can complicate sutures Placement in aorta and mitral annulus and cause paravalvular leakage after valve surgery in radiation associated significant valvular involvement [9]. Eventually , reports show it may be a hallmark of previous heart radiation and thickening more than 5 mm is associated with increased mortality and has incremental value in risk assessment of cancer patients who are treated with radiation to chest wall because of its relation to active cardiovascular mineral deposition [8-10].

Conclusion

To our knowledge, no specified article performing assessment aortomitral curtain thickening as a first abnormal item to predict radiation associated cardiac disease was found. We hypothesized that aortomitral curtain thickening with more than 5 mm, in cancer patients who are treated with radiation to chest, can be used as a first marker for cardiac fibrosis and calcification and future cardiac disease such as constrictive pericarditis, coronary artery disease so on: so due to it, patients should reevaluate in shorter interval to screening for future radiation associated cardiac disease.

References

1. Mattiuzzi, Camilla, and Giuseppe Lippi. Current cancer epidemiology. Journal of epidemiology and global health. 2019; 9: 217-222.
2. Blaes, Anne H, Chetan Shenoy. Is it time to include cancer in cardiovascular risk prediction tools?. The Lancet. 2019; 394: 986-988.
3. Carmen Bergom, Julie A Bradley, Andrea K Ng, Pamela Samson, Clifford Robinson, et al. Past, Present, and Future of Radiation-Induced Cardiotoxicity: Refinements in Targeting, Surveillance, and Risk Stratification. JACC: CardioOncology. 2021; 3; 343-359.
4. Belzile Dugas, Eve, Eisenberg, Mark J. Radiation Induced Cardiovascular Disease: Review of an Underrecognized Pathology. Journal of the American Heart Association. 2021; 10: e21686.
5. Ganatra Sarju, Chatur Safia, Nohria Anju. How to Diagnose and Manage Radiation Cardiotoxicity. JACC: Cardio Oncology. 2020; 2: 655-660.
6. Koutroumpakis E, Palaskas NL, Lin SH, Abe J, Liao Z, et al. Modern Radiotherapy and Risk of Cardiotoxicity. Chemotherapy. 2020; 65: 65-76.
7. Mitchell Joshua D, Cehic Daniel A, Morgia Marita, Bergom Carmen, Toohey Joanne, et al. Cardiovascular Manifestations From Therapeutic Radiation. JACC: CardioOncology. 2021; 3: 360-380.
8. Willemink MJ, Maret E, Moneghetti KJ, Kim JB, Haddad F, Kobayashi Y, et al. Incremental Value of Aortomitral Continuity Calcification for Risk Assessment after Transcatheter Aortic Valve Replacement. Radiol Cardiothorac Imaging. 2019; 1: e19006710.
9. Desai Milind Y, Jellis Christine L, Kotecha Rupesh, Johnston Douglas R, Griffin Brian P, et al. Radiation-Associated Cardiac Disease. JACC:cardiovascular imaging. 2018; 11: 1132-1149.
10. Desai MY, Wu W, Masri A, Popovic ZB, Agarwal S, Smedira NG, et al. Increased aorto-mitral curtain thickness independently predicts mortality in patients with radiation-associated cardiac disease undergoing cardiac surgery. Ann Thorac Surg. 2014; 97:1348-1355.